

**AMENDMENTS TO THE CLAIMS**

1. (currently amended) A process for reducing the amount of residual monomers in aqueous polymer dispersions by chemical aftertreatment, comprising: treating an aqueous polymer dispersion containing residual monomers ~~wherein the aftertreatment is carried out in the aqueous polymer dispersions with addition of~~ with a redox system which comprises

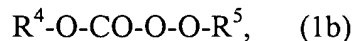
a) from 0.005 to 5% by weight, based on the total weight of all monomers used for the preparation of the polymer dispersion, of at least one oxidizing agent based on an organic peroxide from the class consisting of the

a1) peresters of the general chemical formula



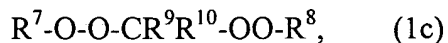
in which  $R^1$  and  $R^2$ , independently of one another, are substituted or unsubstituted alkyl, aryl, cycloalkyl, aralkyl,  $R^3CO$  or  $R^3OCO$ , in which  $R^3$  is unsubstituted or substituted alkyl, aralkyl or aryl, and/or

a2) percarbonates of the general chemical formula



in which  $R^4$  and  $R^5$ , independently of one another, are unsubstituted or substituted alkyl, aryl, cycloalkyl, aralkyl,  $R^6CO$  or  $R^6OCO$ , in which  $R^6$  is unsubstituted or substituted alkyl, aralkyl or aryl, it being possible for the radicals  $R^4$ ,  $R^5$  and  $R^6$  themselves to contain percarbonates, and/or

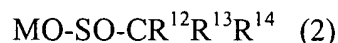
a3) perketal of the general chemical formula



in which  $R^9$  and  $R^{10}$ , independently of one another, are hydrogen or alkyl and  $R^7$  and  $R^8$ , independently of one another, are unsubstituted or substituted alkyl, aryl, cycloalkyl, aralkyl,  $R^{11}CO$  or  $R^{11}OCO$ , in which  $R^{11}$  is unsubstituted or substituted alkyl, aralkyl or aryl,

and

b) from 0.005 to 5% by weight, based on the total weight of all monomers used for the preparation of the polymer dispersion, of at least one reducing agent from the group consisting of the sulfinic acids and the salts thereof having the structure



in which M is hydrogen,  $NH^4$ , a monovalent metal ion or one equivalent of a divalent metal ion of the groups Ia, IIa, IIb, IVa or VIIIb of the Periodic Table of the Elements, in which  $R^{12} = OH$ ,  $NR^{15}R^{16}$ , in which  $R^{15}$  and  $R^{16}$ , independently of one another, are hydrogen or  $C_1$ - $C_6$ -alkyl,

in which  $R^{13} =$  hydrogen or an alkyl, alkenyl, cycloalkyl or aryl group, it being possible for these groups to have 1, 2 or 3 substituents which, independently of one another, are selected from  $C_1$ - $C_6$ -alkyl, OH, O- $C_1$ - $C_6$ -alkyl, halogen and  $CF_3$ , in which  $R^{14} = COOM$ ,  $SO_3M$ ,  $COR^{15}$ ,  $CONR^{15}R^{16}$ ,  $COOR^{15}$ , in which M,  $R^{15}$  and  $R^{16}$  have the meanings stated above, or, if  $R^{13}$  is aryl, this may be unsubstituted or substituted as stated above,  $R^{14}$  is also H, and the salts thereof.

2. (currently amended) The process as claimed in claim 1, wherein the redox system further comprises ~~may additionally contain~~ catalytic amounts of a polyvalent metal ion which may occur in a plurality of valency states.
3. (currently amended) The process as claimed in claim 1, wherein peresters, ~~in particular tert butyl perbenzoate, tert butyl peroxy 3,5,5-trimethylhexanoate~~

and/or ~~tert butyl peroxy 2 ethylhexanoate, particularly preferably tert butyl perbenzoate,~~ are used as oxidizing agents.

4. (currently amended) The process as claimed in claim 1, wherein percarbonates are used as oxidizing agents, ~~in particular 1 (2-ethylhexanoylperoxy) 1,3 dimethylbutyl peroxy pivalate, di(2-ethylhexyl)peroxydicarbonate, 2,5 dimethyl 2,5 di(2-ethylhexanoylperoxy)hexane, tert amylperoxy 2 ethylhexyl carbonate, tert butylperoxy isopropyl carbonate and/or tert butylperoxy 2 ethylhexyl carbonate.~~

5. (currently amended) The process as claimed in claim 1, wherein perketals are used as oxidizing agents, ~~in particular, 1,1 di(tert butylperoxy) 3,3,5-trimethylcyclohexane, 2,2 di(4,4 di(tert butylperoxy)cyclohexyl)propane, 1,1 di(tert butylperoxy)cyclohexane, 2,2 di(tert butylperoxy)butane and/or 3,6,9-triethyl 3,6,9 trimethyl 1,4,7 triperoxonane.~~

6. (currently amended) The process as claimed in claim 1, wherein 2-hydroxyphenylhydroxymethylsulfonic acid or the sodium salt thereof, 4-methoxyphenylhydroxymethylsulfonic acid or the sodium salt thereof, 2-hydroxy-2-sulfinatoacetic acid or the disodium or zinc salt thereof or 2-hydroxy-2-sulfinatopropionic acid or the disodium salt thereof ~~is used as the reducing agent, preferably the disodium salt of 2 hydroxy 2 sulfinatoacetic acid.~~

7. (currently amended) The process as claimed in claim 1, wherein the amount of oxidizing agent added is in the range of from 0.02 to 3% by weight, ~~preferably from 0.02 to 2% by weight, particularly preferably from 0.05 to 1% by weight, in particular from 0.05 to 0.5% by weight,~~ based on the total weight of all monomers, and wherein the amount of reducing agent added is in the range of from 0.02 to 3% by weight, ~~preferably from 0.02 to 2% by weight, particularly preferably from 0.05 to 1% by weight, in particular from 0.05 to 0.5% by weight,~~ likewise based on the total weight of all monomers.

8. (Original) The process as claimed in claim 1, wherein the reducing agent comprises a mixture of disodium 2-hydroxy-2-sulfinatoacetate in an amount in the range of from 50 to 60% by weight, sodium sulfite in an amount in the range of from 30 to 35% by weight and disodium 2-hydroxy-2-sulfonatoacetate in an amount in the range of from 10 to 15% by weight, based on the total weight of the mixture.
9. (Currently amended) The process as claimed in claim 1, wherein the oxidizing agent and the reducing agent are fed in ~~in~~ succession in separate feeds as components for the aftertreatment of the polymer dispersion.
10. (Original) The process as claimed in claim 1, wherein at least one component is fed in by metering.
11. (Currently amended)) The process as claimed in claim 1, wherein at least one of the components is fed in ~~in~~ portions.
12. (Original) The process as claimed in claim 1, wherein first the oxidizing agent and then the reducing agent are added.
13. (Original) The process as claimed in claim 1, wherein the reducing agent is fed in by metering.
14. (Original) The process as claimed in claim 2, wherein the metal ions for the aftertreatment of the polymer dispersion are added after the oxidizing agent and the reducing agent.
15. (Original) The process as claimed in claim 2, wherein the metal ions for the aftertreatment are added after the oxidizing agent and together with the reducing agent.
16. (Original) The process as claimed in claim 2, wherein the polyvalent metal ions used are iron ions.

17. (currently amended) The process as claimed in claim 1, wherein the temperature during the aftertreatment is in the range of from 20 to 100°C; ~~preferably from 25 to 90°C, particularly preferably from 30 to 85°C.~~
18. (Original) The process as claimed in claim 1, wherein the aftertreatment is carried out under a pressure in the range of  $\leq 1$  MPa.
19. (Original) The process as claimed in claim 1, wherein the aftertreatment is carried out at a pH in the range of from 2 to 9.
20. (currently amended) The process as claimed in claim 1, which is carried out using a polymer dispersion having a viscosity in the range of greater than or equal to 100 mPa·s; ~~preferably greater than or equal to 1000 Mpa·s, particularly preferably greater than or equal to 2000 Mpa·s, in particular greater than or equal to 5000 Mpa·s.~~
21. (currently amended) The process as claimed in claim 1, which is carried out using a polymer dispersion which contains, as polymerizable monomers, esters of vinyl alcohol and monocarboxylic acids having from 1 to 18 carbon atoms; ~~in particular vinyl acetate, vinyl propionate, vinyl n-butylate, vinyl laurate, vinyl stearate and/or vinyl versatate, preferably vinyl acetate.~~
22. (currently amended) The process as claimed in claim 1, which is carried out using a polymer dispersion which contains, as polymerizable monomers, esters of  $\alpha,\beta$ -monoethylenically unsaturated mono- and dicarboxylic acids ~~preferably having from 3 to 6 carbon atoms, in particular acrylic acid, methacrylic acid, maleic acid, fumaric acid and itaconic acid;~~ alkanols having from 1 to 12; ~~preferably from 1 to 8 and in particular from 1 to 4 carbon atoms, in particular, methyl, ethyl, n-butyl, isobutyl and 2-ethylhexyl acrylate and methacrylate, dimethyl maleate or di-n-butyl maleate,~~ or nitriles of  $\alpha,\beta$ -monoethylenically unsaturated carboxylic acids; ~~in particular acrylonitrile.~~

23. (currently amended) The process as claimed in claim 1, which is carried out using a polymer dispersion which contains, as polymerizable monomers, aromatic or aliphatic  $\alpha,\beta$ -unsaturated, unsubstituted or halogen-substituted hydrocarbons, in particular ~~ethane, propene, 1-butene, 2-butene, vinyl chloride, vinylidene chloride, styrene,  $\alpha$ -methylstyrene and/or o-chlorostyrene, ethane and styrene being preferred.~~

24. (canceled)